

**WH-words are not ‘interrogative’ pronouns:  
The derivation of interrogative interpretations for constituent questions**

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**Abstract**

I discuss the status of WH-words for interrogative interpretations, and show that the derivation of constituent questions evolves from a specific interplay of syntactic and semantic representations with pragmatics. I argue that WH-pronouns are not ‘interrogative’. Rather, they are underspecified elements; due to this underspecification, WH-words can form a constitutive part not only of interrogative, but also of exclamative and declarative clauses. WH-words introduce a variable of a particular conceptual domain into the semantic representation. Accordingly, they have to be specified for interpretation. Different WH-contexts give rise to different interpretations.

In a cross-linguistic overview, I discuss the characteristic elements contributing to the derivation of interrogatives. I argue that specific particles or their phonologically empty counterparts in the head of CP contribute the interrogative aspect. The speech act of ‘asking’ is then carried out via an intonational contour that identifies a question. By default, this intonational contour operates on interrogative sentences; however, other sentence formats – in particular, those of declarative sentences – are possible as well. The distinction of (a) grammatical (syntactic, semantic and phonological) sentence formats for interrogative and declarative sentences, and (b) intonational contours serving the discrimination of speech acts like questions and assertions, can be related to psychological and neurological evidence.

**1. WH-words and interrogative clauses**

What triggers the interrogative interpretation in constituent questions? What are the elements that contribute the interrogative aspect? Consider the following examples for simple constituent questions:

- (1) Who called?
- (2) What did she say?
- (3) Where does she want to meet?

A characteristic feature these sentences have in common is the occurrence of WH-words: The pronouns who, what and where identify the requested constituent in (1) to (3). WH-words are hence the primary candidates for the interrogative task. So, are WH-words *interrogative* pronouns, that is, pronouns that determine the interrogative interpretation for constituent questions? In this paper, I will argue that they are not. My claim is based on the following evidence:

On the one hand, the presence of WH-phrases is not an idiosyncratic feature of interrogatives: WH-words are not confined to interrogative clauses, but form a constitutive part of a wide range of sentence types. They occur systematically in exclamative and declarative contexts, and introduce sentential complements and attributes. Hence, the lexical entry for WH-words cannot restrict them to interrogative interpretations. Rather, in order to account for the whole range of WH-contexts, we have to assume a less specific representation for WH-words that can cover their contribution to exclamatives and declaratives also.

On the other hand, the presence of WH-words is not the only characteristic feature of interrogatives: There are specific interrogative elements, other than WH-words, that are crucial for the derivation of both constituent questions and yes/no questions. Cross-linguistically, these interrogative elements can either take the form of question particles, or can be phonologically empty. In the latter case, the presence of the interrogative element is reflected syntactically by the movement of WH-phrases into sentence-initial position.

In addition to the syntactic and semantic information provided by the lexical items that contribute to the representation of interrogative sentences, intonation plays a crucial role for the interpretation: In the speech act of asking, specific intonational contours characterise a sentence as a question. By default, these contours are applied to sentences whose semantic and syntactic representations identify them as interrogatives. However, they can also occur for sentences with the grammatical structure of declaratives.

In short, I am going to show that, whereas WH-phrases are not confined to interrogatives, but contribute to exclamatives and declaratives as well, there *are* specific elements other than WH-words that are crucial for the derivation of interrogative sentences. These elements provide the interrogativity in the semantic and syntactic representation of the sentence. The speech act of asking is then carried out via specific intonational contours, marking the sentence as a question. In the following paragraphs, I will develop these points in turn.

## 2. Contexts for WH-words

Although interrogative sentences are the first that come to mind when thinking of clausal contexts for WH-words, WH-phrases are by no means confined to interrogatives. They form a constitutive part of a wide range of sentence types, namely interrogatives, exclamatives and declaratives, cf. (4) to (6) [(6) is an example from spoken German]:

(4) Interrogative: **Where** did Charles stay?

(5) Exclamative: **How** late Karen calls!

(6) Declarative: Anna hört **wen**. ('Anna hears someone. '; lit.: 'Anna hears **whom**.')

What is the semantic contribution of WH-words here? Roughly speaking, they bring up an entity from a specific conceptual domain, namely a place in (4), a degree in (5), and a person in (6). In interrogatives, the specification of this entity is requested; the sentence denotes an open proposition. For example in (4), this open proposition is 'Charles stayed at *e*.', which can be completed by an instantiation for *e*, i.e. by an entity from the domain of places. In exclamatives, the realisation of the entity that is marked by the WH-word is above the norm for this context. So in (5), the emphasis lies on the degree of lateness at which Karen calls; her calling is late to a degree that is above the norm. In declaratives like (6), WH-words are used indefinite referentially. Here, the instantiation of the entity in question is asserted. For example, (6) denotes the proposition that Anna hears someone, although the identity of this person is not specified.

WH-phrases do not only occur in matrix clauses like (4) through (6), but also in subordinate clauses. They introduce sentential attributes, i.e. relative clauses like (7) below, as well as sentential complements like (8) to (10). Within the context of this paper, I will concentrate on sentential complements, and ignore WH-words used as relative pronouns. Sentential complements introduced by WH-phrases can be differentiated along the lines of the matrix clauses discussed above: (8) to (10) give examples for embedded interrogatives, embedded exclamatives, and embedded declaratives, respectively.

(7) Relative clause: the woman **who** called

(8) Embedded interrogative: She wondered **where** he stayed.

(9) Embedded exclamative: It is amazing **how** late she called.

(10) Embedded declarative: She told him **whom** she heard.

Figure 1 illustrates the different contexts in which WH-words can occur:

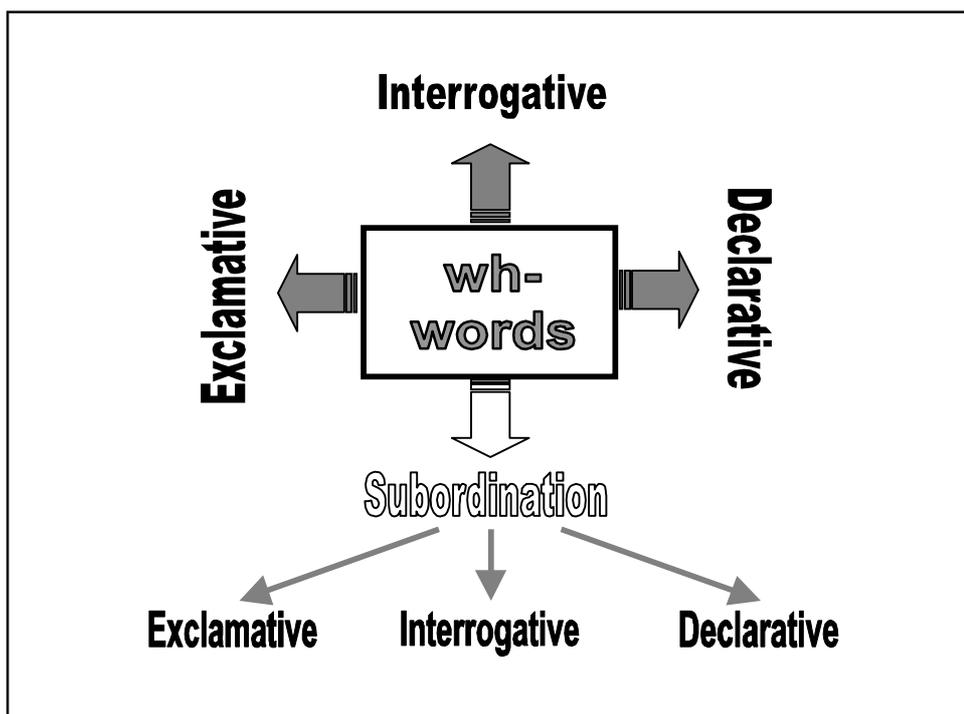


Figure 1: Possible clausal contexts for WH-words

The differentiation of WH-contexts as interrogative, exclamative and declarative can be based on lexical, syntactic and semantic features. The following paragraphs list some diagnostics.

#### A. Interrogatives versus Declaratives:

Ever and any- can occur in interrogatives, but not in declaratives:

(11) I {wonder/\*know} how he **ever** did it / how **anyone** did it.

Interrogatives can be expanded with namely or that is and a disjunction (12), whereas in declaratives, the expansion includes a single element or a conjunction (13) (cf. Munsat, 1986):

(12) I wonder what you bought, **namely** a dress **or** a sweater?

(13) I know what you bought, **namely** a dress (**and** a sweater).

In Spanish, the WH-word is preceded by the complementiser que in embedded interrogatives, but not in embedded declaratives (cf. Suñer, 1993):

(14) Sue se preguntó **que** cuántas charlas planeaban los estudiantes.  
(Sue wondered how many talks the students were planning.)

(15) Bri sabía (**\*que**) cuántas charlas planeaban los estudiantes.  
(Bri knew how many talks the students were planning.)

#### B. Interrogatives versus Exclamatives:

In main clauses, English employs subject-auxiliary inversion in interrogatives (16), but not in exclamatives (17):

(16) What proposal did he make?

(17) What a proposal he made!

How is used as an adverb of manner in interrogatives (18), and as an adverb of degree in exclamatives (19) (cf. Huddleston, 1993):

(18) **How** did he persuade her? / I wonder **how** he persuaded her. [ $\approx$  *in which way*]

(19) **How** he hated her! / It is amazing **how** he hated her. [ $\approx$  *very much*]

Else is used in interrogatives, but not in exclamatives (cf. Elliott, 1974):

(20) **How else** could she have done it? / \***How else** they would have admired her.

A singular count noun following what is combined with the indefinite article in exclamatives (21), but not in interrogatives (22) (cf. Huddleston, 1993):

(21) {**What a** / \* **what**} proposal he made!

(22) {**What** / \* **what a**} proposal did he make?

C. Declaratives vs. Exclamatives:

How, when used as an adverb of degree in combination with an adjective, refers to a degree above the norm in exclamatives (23), but not in declaratives (24); making the example in (25) ambiguous:

(23) It is amazing **how old** they are – much older than anyone had guessed.

(24) I told her **how old** they are – namely only six years old.

(25) “We know how much he respects your abilities as a businessman, don’t we, Cindy?” “Nice of you to say so,” said Rupert, apparently perceiving no ambiguity.<sup>1</sup>

### 3. The derivation of interrogative clauses: A cross-linguistic overview

Hence, although the presence of WH-words is a characteristic feature of constituent questions, WH-words are not confined to interrogative contexts. They occur in three clausal contexts that can be distinguished as interrogative, exclamative and declarative. Accordingly, they cannot be specified for interrogativity in the lexicon. So if it is not WH-words that contribute the interrogative aspect in constituent questions, where does the interrogativity come from?

Let us have a look at the elements that are crucial for the derivation of questions cross-linguistically. In general, there are two ways in which languages can mark a clause as a WH-interrogative (cf. Cheng, 1997): (i) by lexical items, namely interrogative particles like Japanese no (cf. 26) or Burmese lè (cf. 27); or (ii) by syntactic WH-movement, the movement of WH-phrases into sentence-initial position (cf. the German example in (28)):

(26) Taroo-wa nani-o katta **no**? (cf. Richards, 1997:132)  
 Taroo-TOP what-ACC bought INTERROGATIVE PARTICLE  
*What did Taroo buy?*

(27) hkúná-meĩnhkáleì bãthu-**lè**? (cf. Okell, 1969:338)  
 just.now-girl who-INTERROGATIVE PARTICLE  
*Who was the girl just now?*

(28) **Wen** hört sie? vs. Sie hört **wen**.  
 whom hears she she hears whom

<sup>1</sup> from: Caudwell, Sarah (1995). *The Shortest Way to Hades*. New York: Dell. p. 41.

*Whom does she hear?*

*She hears someone.*

Assuming a standard CP-analysis for the syntactic structure of sentences, we can account for the movement of WH-phrases by a strong feature [+wh] in the specifier of the CP. This feature is checked by WH-phrases that move into sentence-initial position. Via spec-head agreement, it is correlated with the element in C<sup>0</sup>. This element can be analysed as an abstract lexical item that triggers the WH-movement. In a unified approach to constituent interrogatives, we can then identify their syntactic representation as a CP whose head is either an interrogative particle or a phonologically empty element, where the latter triggers the movement of WH-phrases into the specifier (cf. figure 2).

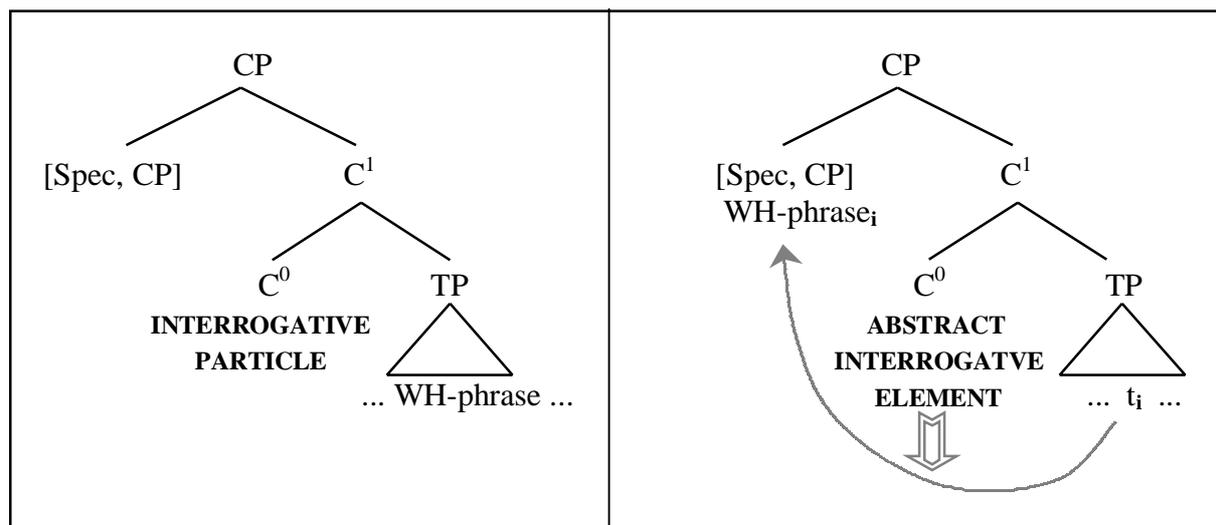


Figure 2: Syntactic derivation of interrogatives

It is hence the elements in the head of the CP that mark a clause as interrogative. Accordingly, we can identify interrogative particles or their phonologically empty counterparts as those elements that contribute the interrogative aspect for the interpretation.<sup>2</sup> In contrast to that, WH-words are not specified for interrogativity (or exclamativity or declarativity). It is this underspecification that makes them flexible enough to contribute to interrogative, exclamative and declarative semantics alike.

As we have seen above, WH-words contribute to the respective semantic representation by introducing an entity of a certain conceptual domain. We can account for that by defining as their semantic representation a variable of a particular conceptual domain (for instance, PERSON, PLACE, TIME etc.). In the course of derivation, this variable becomes bound by an interrogative (or, *mutatis mutandis*, exclamative or declarative) operator that is contributed by an interrogative particle or its phonologically empty counterpart.

(29) and (30) give a sketch of how semantic representations would have to look like that are in accordance with this approach (Note that these schemata do not determine a specific definition of interrogativity. In particular, ‘?’ is a variable over possible formalisations of the interrogative operation.):

(29) WH-words:  $x_D$

[D is a conceptual domain:  $D \in \{\text{PERSON, TIME, PLACE, ...}\}$ ];

<sup>2</sup> This supports approaches that define interrogative semantics on the basis of sentences (see for instance, Groenendijk & Stokhof, 1982).

x is a variable ranging over entities from D.]

(30) interrogative particles, phonologically empty interrogative element in  $C^0$ :

(a) in WH-interrogatives:  $\lambda p [\exists e (\text{INST}(e, ?x (p^{\alpha/x})))]$

(b) in yes/no interrogatives:  $\lambda p [?e (\text{INST}(e,p))]$

[‘INST’ is a function that maps a proposition  $p$  onto an event  $e$  (cf. Bierwisch, 1988);

$p^{\alpha/x}$  is derived from a proposition  $p$  by replacing all free occurrences of a variable  $\alpha$  by  $x$ .]

(31) gives the lexical entries for ‘who’ as an example for WH-words, and for the interrogative elements in the head of CP. These lexical entries have the form of triples containing phonological, syntactic, and semantic information (cf. Jackendoff, 1997; Wiese, 1999a,b).

(31) ‘who’:  $\langle /who/, D^0 [+wh], x_{\text{PERSON}} \rangle$

interrogative particle (e.g. Japanese ‘no’):  $\langle /no/, C^0, \lambda p [\exists e (\text{INST}(e, ?x (p^{\alpha/x})))] \rangle$

abstract interrogative element (e.g. in English):  $\langle \emptyset, C^0, \lambda p [\exists e (\text{INST}(e, ?x (p^{\alpha/x})))] \rangle$

#### 4. The contribution of intonation

So far, we have discussed the syntactic and semantic structure of interrogatives, accounting for questions like those in (32) and (33):

(32) Who called? [constituent question]

(33) Did Karen call? [yes/no-question]

However, we can also ask questions with sentences like (34), where no interrogative element is evident; (34) has the same grammatical structure as the sentence in (35) which is typically used in an assertion:

(34) Karen called? [yes/no-question]

(35) Karen called. [assertion]

Let us distinguish ‘interrogatives’ and ‘declaratives’ as clausal types, from speech acts like ‘questions’ and ‘assertions’. As the examples show, we can not only use interrogatives (32; 33), but also declaratives (34) for questions, given the appropriate intonational contour. It is this intonational contour (graphemically indicated by the question mark in (34)) that distinguishes (34) from (35); in other words: it is the intonational contour that distinguishes the speech act ‘question’ from an ‘assertion’. The sentence provides phonological, syntactic and semantic structures, defining ‘interrogative’ representations (32; 33) or ‘declarative’ representations (34; 35). Specific intonational contours in the utterance of the sentence then mark the illocutionary act as a ‘question’ (32 – 34) or an ‘assertion’ (35).

This distinction of grammatical structures (phonological, syntactic, and semantic representations) and pragmatic operations performed via intonational contours is supported by psychological and neurological underpinnings: Experimental and clinical evidence suggests that different hemispheres of the brain can be associated with (a) grammatical knowledge, and (b) the processing of intonation serving the discrimination of speech acts.

Language is primarily associated with the left hemisphere. Neuro-imaging techniques such as ERP (event-related evoked potentials) and fMRI (functional magnetic resonance imaging) typically show an activation of cortical regions in the left hemisphere for linguistic tasks (cf. Friederici, 1999; Springer & Deutsch, 1981). Brain damage in this hemisphere, particularly in Broca’s and in Wernicke’s area, can induce lexical, syntactic, semantic or phonological impairments (cf. Grodzinsky, 1990; Opler & Gjerlow, 1999).

Interestingly, the linguistic structures involved include grammaticalised tone in languages like Thai or Chinese. In these languages, tone discriminates between lexical items, it is part of the grammatical (phonological) representation; in contrast to intonational contours that discriminate between different speech acts. For speakers of Thai, a left-hemispheric dominance

can be observed for the processing of grammaticalised tone (cf. van Lancker & Fromkin, 1973). Correspondingly, the production and perception of grammaticalised tone has been shown to be impaired among aphasic patients with left-hemispheric lesions, in Thai (Gandour et al., 1992) and in Chinese (Eng Huie, 1994).

In contrast to this, the processing of intonational contours that distinguish questions from assertions is usually spared after left-hemispheric brain damage (cf. Danly & Shapiro, 1982), while lesions in the *right* hemisphere can involve impairments in the production and interpretation of intonational contours and affective speech (cf. Ross & Mesulam, 1979). For intact-brain subjects, a right-hemispheric dominance has been shown for the processing of intonational contours serving the discrimination of questions versus assertions in English (Blumstein & Cooper, 1974).

These dissociations can be interpreted as evidence for a psychological reality of the distinction between grammatical structures defining ‘interrogatives’ and ‘declaratives’ and intonational contours discriminating ‘questions’ and ‘assertions’.

### **5. Overview: WH-words and the derivation of constituent questions**

To sum up our discussion, two systems are crucial for the derivation of constituent questions: grammar and pragmatics. The grammatical system contributes phonological, syntactic and semantic representations that give rise to an interrogative interpretation of the sentence; the pragmatic system renders the speech act ‘question’, identified via intonational contours operating on grammatical representations.

Within the linguistic representation, it is the elements in the head of the sentence – interrogative particles or their phonologically empty counterparts – that bear on the interrogative aspect. WH-words, on the other hand, can appear in interrogative, exclamative and declarative contexts alike; they are semantically underspecified lexical items that introduce a variable of a particular conceptual domain into the semantic representation. In the course of derivation, this representation can be specified as interrogative by the elements in the head of the sentence.

This approach to WH-words as semantically underspecified elements allows us to assign one lexical entry to WH-words occurring in interrogative and non-interrogative contexts, and to give a unified account for interrogative particles and their phonologically empty counterparts. This enables us to assign the same semantic representation to interrogatives in languages with and without WH-movement, and to treat movement as a genuinely syntactic phenomenon.

Figure 3 illustrates (for the sample sentence ‘Who sings?’) the contribution of WH-words to the generation of interrogatives, and the status of intonational contours in the derivation of constituent questions. In accordance with a theory that assumes a Tripartite Architecture for the language faculty (Jackendoff, 1997), phonology, syntax and semantics constitute independent parallel generative systems. Corresponding elements in the generation of phonological, syntactic and semantic structures are marked by the same index (‘A’ correlates the respective representations for the WH-word ‘who’, ‘B’ marks representations for the abstract interrogative element, and ‘C’ identifies the entire sentence).



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